

PUBP 3120: STATISTICAL ANALYSIS FOR PUBLIC POLICY (30379) SPRING 2026

Class time and location:

Time: Mon & Wed, 8 am - 9:15 am

Location: Swann Room 106

Instructor information:

Name: Ryan Anthony

Email address: ranthony31@gatech.edu

Office hours: DM Smith 112, Tues 4 pm – 5 pm or by appointment

Description

This course serves as an introduction to probability, descriptive statistics, inferential statistics, and spreadsheets. The focus of the course is the application of basic statistical concepts to public policy and administration. It is intended for students who have a wide range of methodological backgrounds (e.g. mathematics, statistics, econometrics, and computer science).

Course Goals and Learning Outcomes

This course introduces students to the foundational concepts of statistics. The primary emphasis will be on applying statistics to applications in public policy. Throughout the semester, students will learn how to extract meaning from statistical data and how to generate conclusions with a critical lens.

This course provides a basic introduction to:

1. Descriptive statistics
2. Probability
3. Inferential statistics
4. Regression
5. Research design

Upon successful completion of this course, you should be able to:

1. Discuss basic concepts in probability and statistics with experts and laypeople.
2. Describe and analyze social science data.
3. Understand the importance and limits of social science data.
4. Interpret and critique public policy research.

Course Requirements and Grading:

Participation:	10%
Problem Sets:	40% (10% each)
Midterm Exam:	20%
Final Exam:	30%

Attendance is required for this class and contributes to the participation component (10%). You will be permitted 3 absences with no questions asked. After that point, only excused absences will be permitted with no cost to your grade.

There will be four problem sets spread throughout the semester, each worth 10% of your overall grade (40% total). These assignments will be a mix of statistical and conceptual questions. These problem sets will be due on the following dates:

Problem set #1: February 4, 2026 at 11:59pm
Problem set #2: February 25, 2026 at 11:59pm
Problem set #3: April 6, 2026 at 11:59pm
Problem set #4: April 22, 2026 at 11:59pm

There will be two exams in this class. The first exam, which will cover the material from the first half of the semester, will be on March 4, 2026 and will count for 20% of your grade. Students will have the opportunity to revise their midterm exam and earn back up to half of the points lost on the original submission.

The second exam will cover material from the entire semester but will focus more heavily on the material that we learned after the midterm exam took place. This exam is worth 30% of your grade and will occur on the date and time assigned by the university (May 1, 2026 at 8 am).

Late work:

Late work will be accepted for 5 days following the due date. On each day that an assignment is late, 10% of the grade for that assignment will be deducted. An assignment turned in one day late can receive a maximum of 90%, while an assignment turned in two days late can receive a maximum of 80%, and so on. After 5 days, I will no longer accept the late assignment.

Grading Scale

A 90-100%
B 80-89%
C 70-79%
D 60-69%
F 0-59%

Course Text

The primary textbook is *Statistical Methods for the Social Sciences 5th Edition* by Alan Agresti (previous editions co-authored with Barbara Finlay). We will be using the 5th edition, but you can feel free to purchase an earlier version if it is more affordable. You may purchase this book in electronic format or in hard copy. More details on this will be provided on the first day of class.

Additionally, there is an optional book for this class: *Naked Statistics: Stripping the Dread from the Data* by Charles Wheelan. We will be using this book to gain intuition on the concepts we will be discussing in class. You may purchase this book in electronic format or in hard copy. Any additional readings will be made available through Canvas.

Additional Materials

You must bring a laptop to class. We will be using Microsoft Excel throughout the semester to conduct our computer-based applications. Excel is made available by Tech via Microsoft 365.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit the GT Policy Library. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Note on AI Tools

The use of AI tools (e.g., ChatGPT) is permitted in this course. You are encouraged to use these tools as a supplement to your learning, though not as a replacement for it. Writing and working through statistical problems on your own forces you to think carefully about the concepts and assumptions covered in this course, and interpretation of results. That process is where learning happens. Relying on AI tools to do the thinking or writing for you may result in faster completion times for assignments, but it will come at the expense of your development of the skills that this course is designed to teach. Similarly, reading and interpreting statistical results takes practice. AI tools can summarize material efficiently and quickly, but overreliance on these summaries will weaken your ability to understand methods, evaluate evidence, and reason through uncertainty. If used thoughtfully, AI tools can help you check your understanding, explore alternative explanations, or clarify confusing points. If used uncritically, these tools will short-circuit the learning process. Your goal in this course is not just to get correct answer, but to build statistical reasoning skills that will matter in future coursework, research, and professional settings.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or <http://disabilityservices.gatech.edu/> as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See <http://www.catalog.gatech.edu/rules/22/> for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Statement on Inclusion

I wholeheartedly support the Georgia Institute of Technology's commitment to creating a campus free of discrimination on the basis of race, color, religion, sex, national origin, age, disability, sexual orientation, gender identity, or veteran status. I seek to create an intellectual climate that allows us all to better understand the similarities and differences of those who constitute the Georgia Tech community, as well as the necessity of working against inequalities that may also manifest here as they do in the broader society.

Campus Resources for Students

If necessary, there are a variety of resources available to you that can help you succeed in this class and at Georgia Tech. For help with academic issues, please see the Georgia Tech Library, the Communication Center, and the Center for Academic Success. For mental and emotional help, please reach out to the Counseling Center, the Division of Student Life, and the Women's Resource Center. For a full list, see: https://ctl.gatech.edu/sites/default/files/documents/campus_resources_students.pdf

Core IMPACTS Statement

This is a Core IMPACTS course that is part of the Social Sciences area.

Core IMPACTS refers to the core curriculum, which provides students with essential knowledge in foundational academic areas. This course will help master course content, and support students' broad academic and career goals.

This course should direct students toward a broad Orienting Question:

- How do I understand human experiences and connections?

Completion of this course should enable students to meet the following Learning Outcomes:

- Students will effectively analyze the complexity of human behavior, and how historical, economic, political, social or geographic relationships develop, persist or change.

Course content, activities and exercises in this course should help students develop the following Career-Ready Competencies:

- Intercultural Competence
- Perspective-Taking
- Persuasion

Course Schedule

Date	Topic	Readings	Assignments
Week 1	Introduction		
January 12, 2026	Introduction to syllabus What is statistics?	Agresti – Chapter 1 (1.1)	
January 14, 2026	Research questions Descriptive statistics vs. inferential statistics	Agresti – Chapter 1 (1.2 and 1.4) Wheelan – Introduction and Chapter 1	
Week 2	Sampling		
January 19, 2026	MLK Day - No Class		
January 21, 2026	Validity and Reliability Types of variables and data	Agresti – Chapter 2 (2.1)	
Week 3	Measurement and Descriptive Statistics		
January 26, 2026	Class Cancelled – Winter Weather		
January 28, 2026	Randomization Sampling Bias	Agresti – Chapter 2 (2.2-2.4)	
Week 4	Variability and Intro to Probability		
February 2, 2026	Graphical versus numeric descriptive statistics Describing the center of data Deceptive graphs	Agresti – Chapter 3 (3.1-3.2) Wheelan – Chapter 2&3	
February 4, 2026	Describing the variability of data	Agresti – Chapter 3 (3.13-3.5)	Problem set #1 due: February 9, 2026 at 11:59 pm
Week 5	Distributions and Intervals		
February 9, 2026	Probability	Agresti – Chapter 4 (4.1-4.3) Wheelan – Chapter 5&6	
February 11, 2026	Probability distributions Standard normal distribution Central Limit Theorem (CLT)	Agresti – Chapter 4 (4.4-4.6) Wheelan – Chapter 8	
Week 6	Significance Tests		
February 16, 2026	Point and interval estimation Confidence interval for proportion	Agresti – Chapter 5 (5.1-5.2) Wheelan – Chapter 9	
February 18, 2026	T-distribution Sample size Confidence interval for mean	Agresti – Chapter 5 (5.3-5.4)	
Week 7	Significance Tests and Midterm Review		

February 23, 2026	Bias 5 parts of a significance test Test for mean Test for proportion	Agresti – Chapter 6 (6.1-6.3, first half of 6.5) Wheelan – Chapter 7	
February 25, 2026	Types of errors Limitations of significance tests Calculating p values	Agresti – Chapter 6 (6.4-6.7)	Problem set #2 due: February 26, 2026 at 11:59 pm
Week 8	Midterm Exam Week		
March 2, 2026	Midterm Review		
March 4, 2026	Midterm		Midterm Exam
Week 9	Comparing Two Groups		
March 9, 2026	Categorical and quantitative comparisons Comparing means of dependent samples Other methods for comparing means and proportions	Agresti – Chapter 7 (7.1-7.4)	
March 11, 2026	Analyzing association between categorical variables	Agresti – Chapter 8 (8.1-8.4)	
Week 10	Linear Regression		
March 16, 2026	Linear relationships Least squares equation Linear regression model	Agresti – Chapter 9 (9.1-9.3) Wheelan – Chapter 11	
March 18, 2026	Correlation Slope and correlation Model assumptions and violations Ecological fallacy	Agresti – Chapter 9 (9.4-9.6) Wheelan – Chapter 4	Midterm revision due: March 18, 2026 at 11:59 pm
Week 11	Spring Break!		
March 23, 2026	No class		
March 25, 2026	No class		
Week 12	Multivariate Relationships		
March 30, 2026	Association and causality Causal diagrams Causal inference	Agresti – Chapter 10 (10.1- 10.2)	
April 1, 2026	Controlling for other variables Types of multivariate relationships Inferential issues in control	Agresti – Chapter 10 (10.3- 10.4)	Problem set #3 due: April 6, 2026 at 11:59 pm
Week 13	Multiple Regression		
April 6, 2026	Randomized experiments	N/A	
April 8, 2026	The multiple regression model Examples of regression R-squared Inference for multiple regression	Agresti – Chapter 11 (11.1- 11.2)	

Week 14	Comparing and Building Models		
April 13, 2026	Comparing models Standardized regression coefficients	Agresti – Chapter 11 (11.3-11.5)	
April 15, 2026	Multiple regression with quantitative and categorical variables	Agresti – Chapter 13 (13.1-13.3)	
Week 15	Building Models and Applications		
April 20, 2026	Regression diagnostics Model selection Multicollinearity	Agresti – Chapter 14 (14.1-14.3) Wheelan – Chapter 12	
April 22, 2026	Modern Applications	TBD	Problem set #4 due: April 22, 2026 at 11:59 pm
Week 16	Final Exam Review		
April 27, 2026	Review		
May 1, 2026	Final Exam		Final Exam (Swann Room 106)